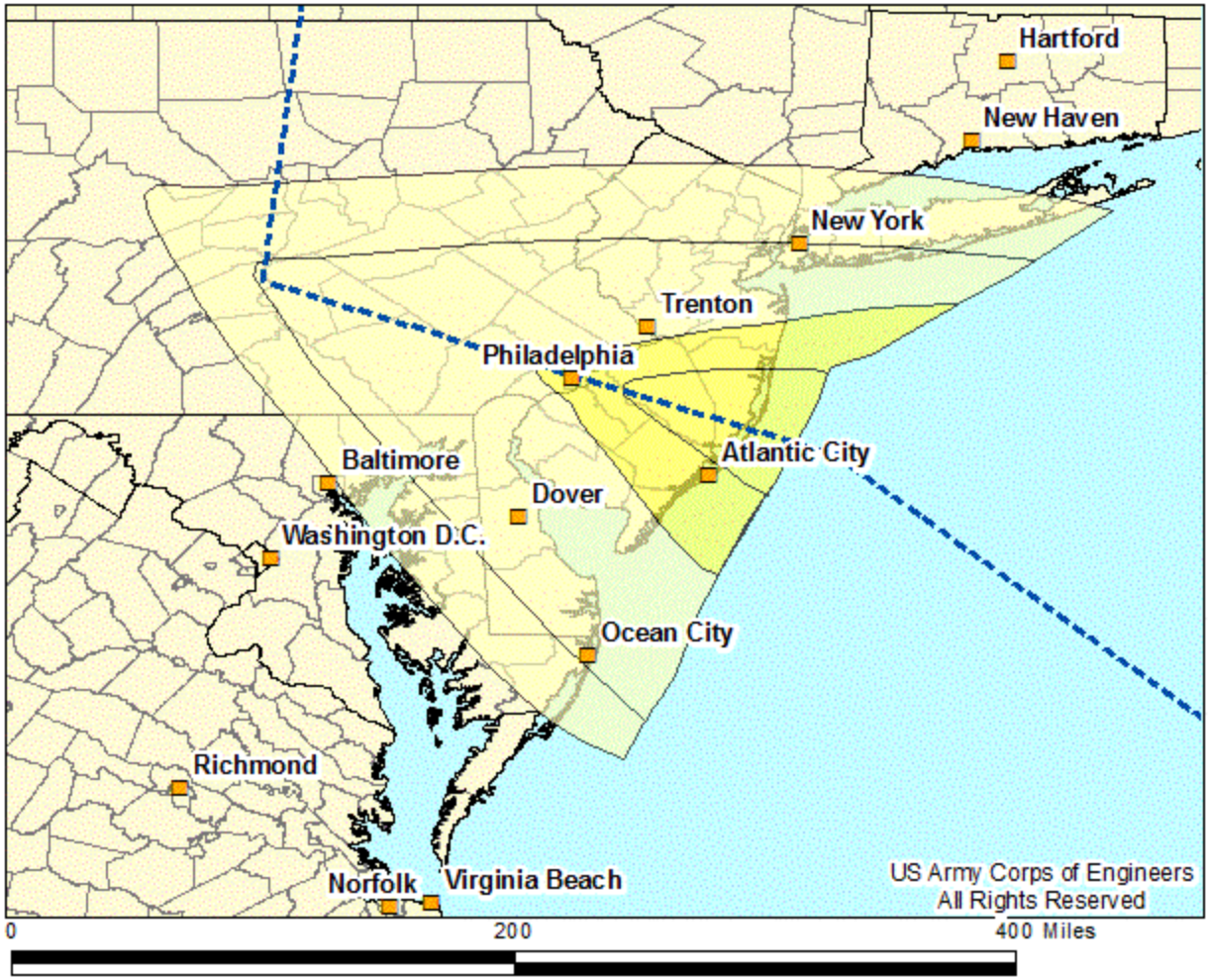
Hurricane Sandy Projected Damage Areas

US Army Corps of Engineers

Landfall Expected In About 48 Hours

For Planning Purposes Only!



Post Landfall Projected Damage Areas

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Projected Damage Areas

- CAT 0-type damage
- CAT 1-type damage
- CAT 2-type damage
- CAT 3-type damage
- CAT 4-type damage
- CAT 5-type damage

Information provided on this page displays a projected or actual Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast and extrapolated by LRL staff to represent a landfall condition that has either occurred or may occur in the near future.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Projected Damage Areas

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

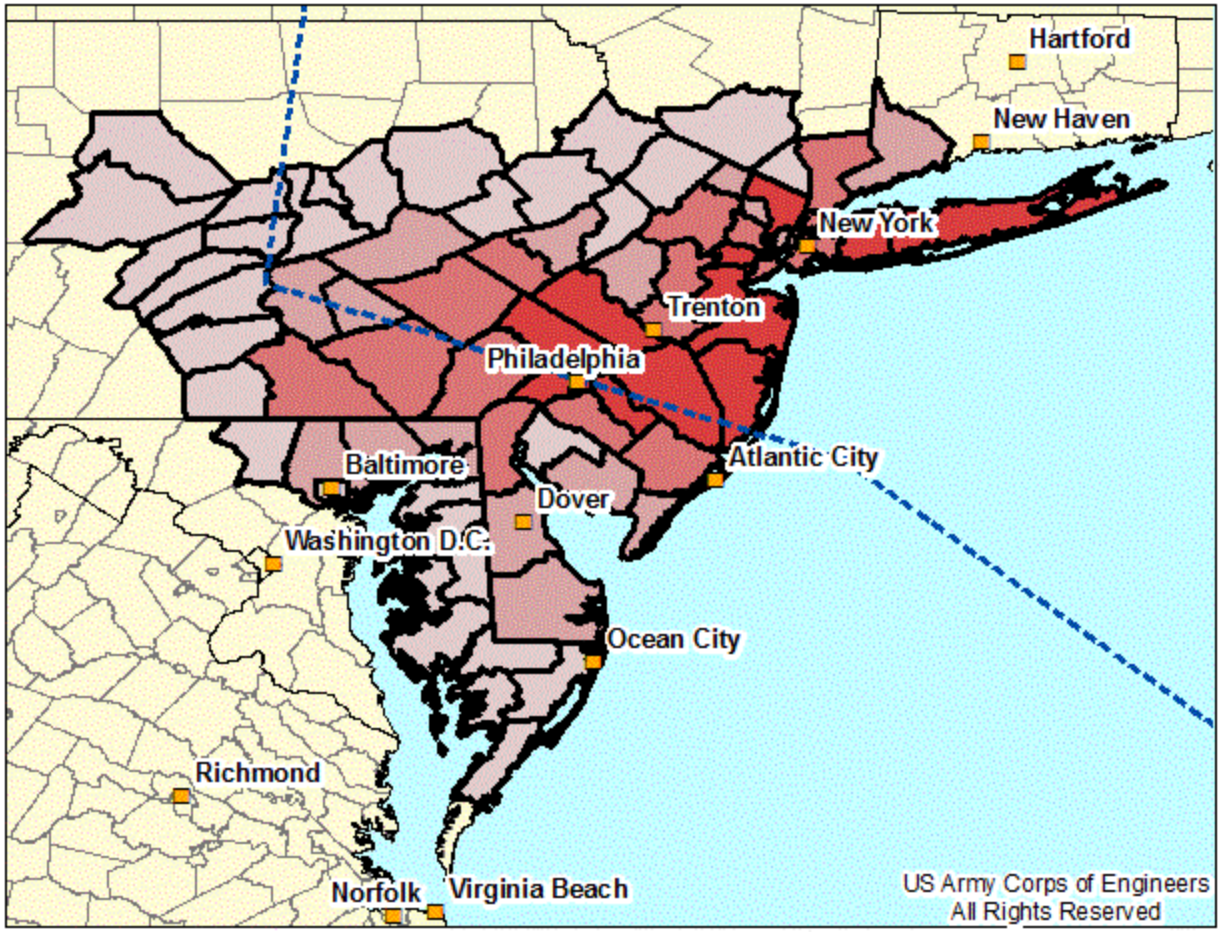
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Post Landfall Debris Model Results

New Jersey - 7,563,000 Yards
Pennsylvania - 5,644,000 Yards
New York - 2,961,000 Yards
Delaware - 749,000 Yards
Maryland - 741,000 Yards
Connecticut - 106,000 Yards

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Debris

- < 100,000 cubic yards
- 100,000 - 249,999 cubic yards
- 250,000 - 499,999 cubic yards
- 500,000 - 999,999 cubic yards
- >1,000,000 cubic yards

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast. The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Debris Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!

State	Yards per State	County	Yards per County
Connecticut		Fairfield County	106,000
Connecticut	106,000		
Delaware		Kent County	167,000
		New Castle County	356,000
		Sussex County	226,000
Delaware	749,000		
Maryland		Baltimore County	217,000
		Baltimore city	61,000
		Caroline County	22,000
		Carroll County	2,000
		Cecil County	111,000
		Dorchester County	7,000
		Harford County	150,000
		Kent County	16,000
		Queen Anne's County	24,000
		Somerset County	2,000
		Talbot County	17,000
		Wicomico County	54,000
		Worcester County	58,000
Maryland	741,000		
New Jersey		Atlantic County	471,000
		Bergen County	506,000
		Burlington County	614,000
		Camden County	591,000
		Cape May County	142,000
		Cumberland County	187,000
		Essex County	298,000
		Gloucester County	398,000

State	Yards per State	County	Yards per County
New Jersey		Hudson County	211,000
(continued)		Hunterdon County	139,000
		Mercer County	389,000
		Middlesex County	566,000
		Monmouth County	535,000
		Morris County	281,000
		Ocean County	858,000
		Passaic County	240,000
		Salem County	77,000
		Somerset County	354,000
		Sussex County	61,000
		Union County	562,000
		Warren County	83,000
New Jersey	7,563,000		
New York		Bronx County	261,000
		Kings County	333,000
		Nassau County	651,000
		New York County	157,000
		Orange County	< 1,000
		Queens County	351,000
		Richmond County	353,000
		Rockland County	88,000
		Suffolk County	512,000
		Westchester County	255,000
New York	2,961,000		
Pennsylvania		Adams County	6,000
		Berks County	408,000

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Debris Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Debris Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!

State	Yards per State	County	Yards per County
Pennsylvania		Bucks County	578,000
(continued)		Carbon County	35,000
		Centre County	9,000
		Chester County	426,000
		Clinton County	3,000
		Columbia County	30,000
		Cumberland County	92,000
		Dauphin County	239,000
		Delaware County	627,000
		Juniata County	10,000
		Lancaster County	461,000
		Lebanon County	128,000
		Lehigh County	309,000
		Luzerne County	42,000
		Mifflin County	5,000
		Monroe County	72,000
		Montgomery County	536,000
		Montour County	9,000
		Northampton County	231,000
		Northumberland County	47,000
		Perry County	26,000
		Philadelphia County	902,000
		Pike County	4,000
		Schuylkil County	104,000
		Snyder County	19,000
		Union County	17,000
		York County	269,000
Pennsylvania	5,644,000		
Virginia		Accomack County	< 1,000
Virginia			

The amount of debris forecasted is possible total volume, not necessarily the volume that may need to be removed with Federal funds, but does not include volume that may be covered by private insurance. Debris volume may include storm surge generated debris.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Debris Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

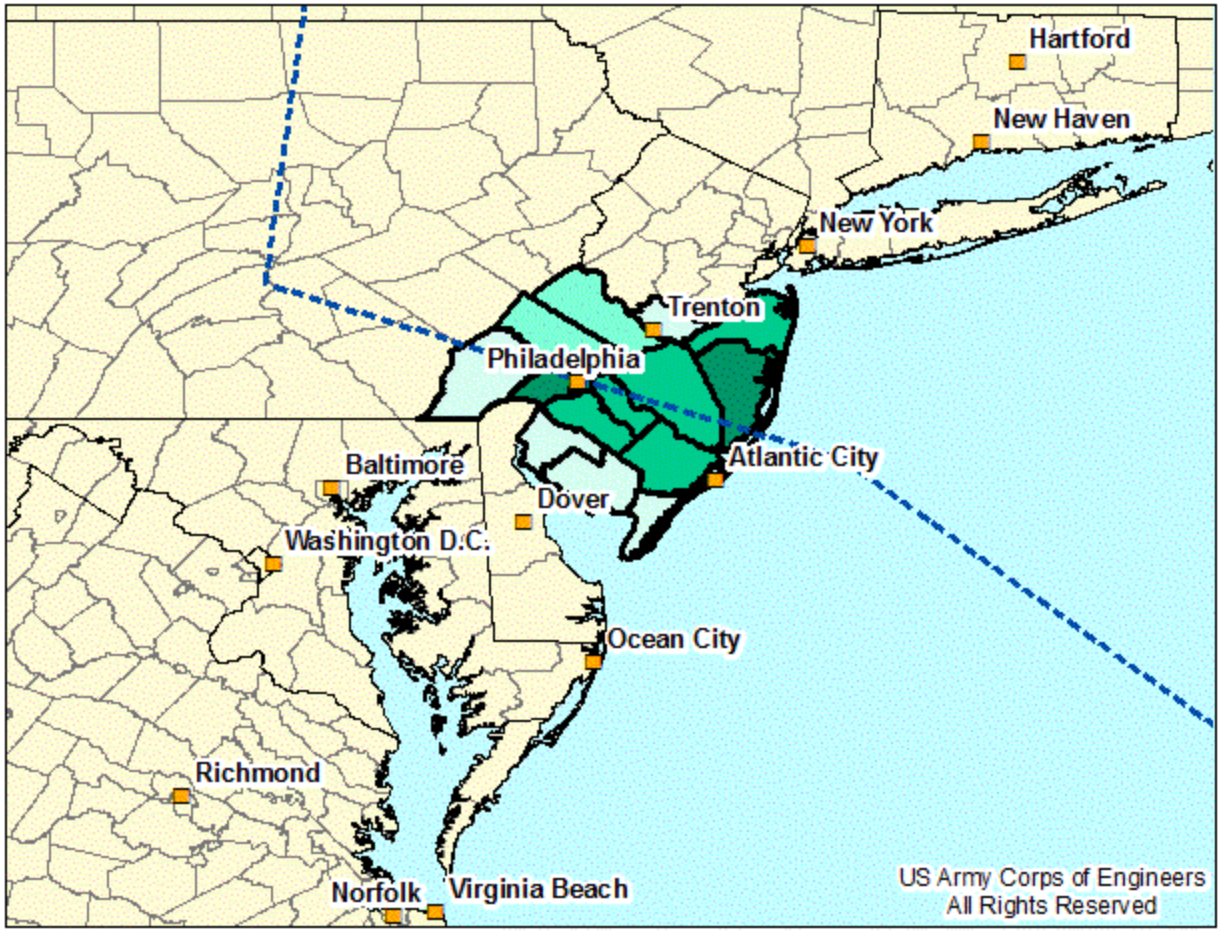
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Commodities Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Post Landfall Water Model Results

Day One / Day Two / Day Three
NJ – 33/56/112 Truckloads
PA – 18/37/75 Truckloads

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Commodities

- < 5 Trucks Each
- 5 - 10 Trucks Each
- 11 - 20 Trucks Each
- 21 - 40 Trucks Each
- > 40 Trucks Each

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC ***(0500 EDT 10/28/2012)*** forecast. The amount of commodities forecasted is based on Mission Guide Book requirements and SME input. The graphic represents daily needs with a ramp-up in the distribution system – three days for Points of Distribution (PODs) to be fully in place and operational. Volume shown is for each commodity – water and ice. Commodity need may be supplied by multiple agencies and/or sources.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Commodities Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Commodities Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!

State	Truckloads per State	County	Truckloads per County
New Jersey		Atlantic County	17
		Burlington County	20
		Camden County	16
		Cape May County	2
		Cumberland County	2
		Gloucester County	15
		Mercer County	1
		Monmouth County	12
		Ocean County	26
		Salem County	1
New Jersey	112		
Pennsylvania		Bucks County	5
		Chester County	1
		Delaware County	22
		Montgomery County	7
		Philadelphia County	40
Pennsylvania	75		

Source: US Army Corps of Engineers, All Rights Reserved

The amount of commodities forecasted is based on Mission Guide Book requirements and SME input and the above table indicates suggested daily needs based on full deployment of a commodities distribution system. Volume shown is for each commodity – water and ice. Commodity need may be supplied by multiple agencies and/or sources.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Commodities Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

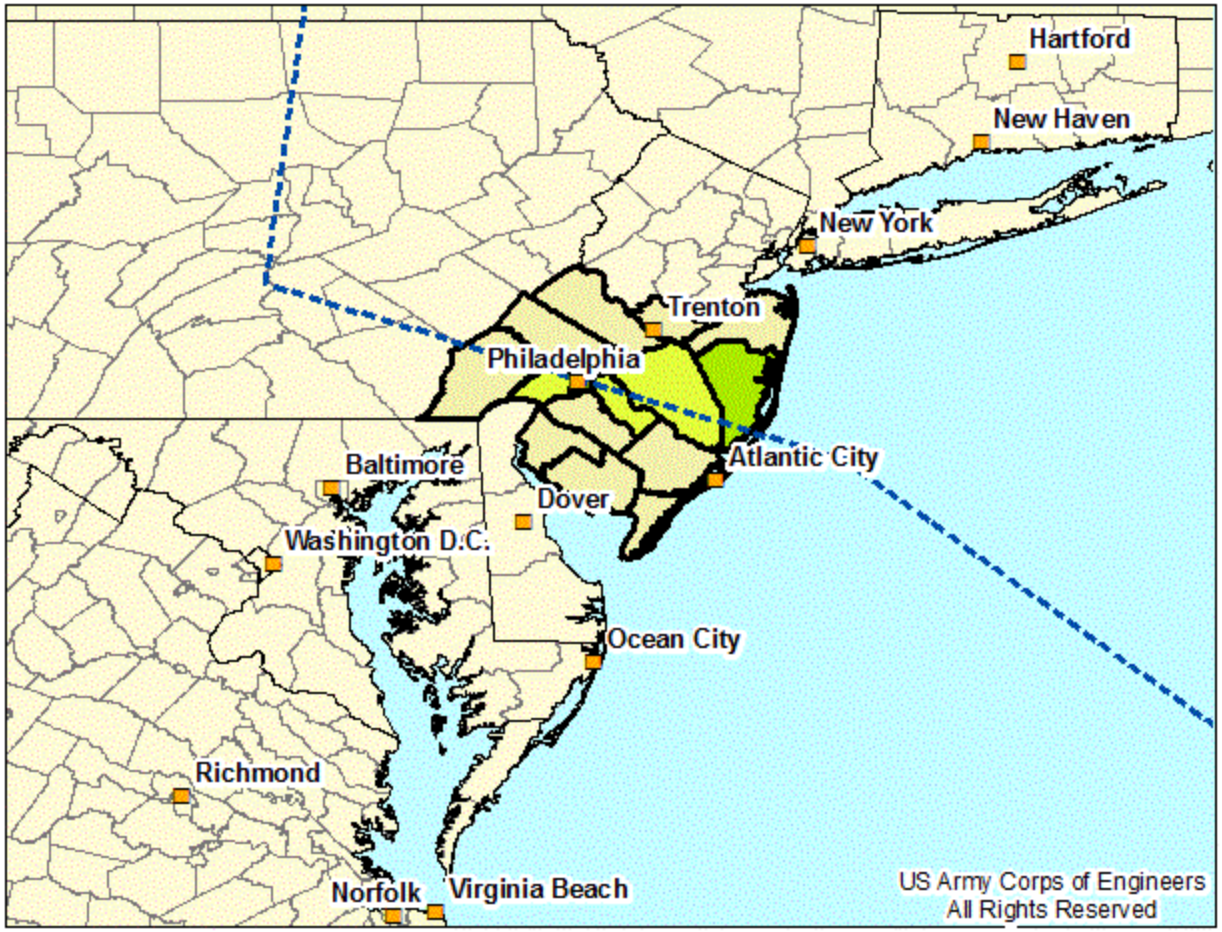
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Temporary Roofing Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Post Landfall Temporary Roofing Model Results

New Jersey - 14,600
Pennsylvania - 12,500

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Temporary Roofing

- < 2,000 units
- 2,000 - 3,999 units
- 4,000 - 5,999 units
- 6,000 - 9,999 units
- > 10,000 units

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast. Temporary roofing is based on 2% in CAT 1.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Roofing Model	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	Page 7 of 21

US Army Corps of Engineers

Hurricane Sandy Temporary Roofing Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!

State	House Units per State	County	House Units per County
New Jersey		Atlantic County	1,500
		Burlington County	2,700
		Camden County	3,000
		Cape May County	300
		Cumberland County	200
		Gloucester County	1,600
		Mercer County	< 100
		Monmouth County	1,200
		Ocean County	4,100
		Salem County	< 100
New Jersey	14,600		
Pennsylvania		Bucks County	500
		Chester County	< 100
		Delaware County	2,300
		Montgomery County	700
		Philadelphia County	9,000
Pennsylvania	12,500		

Temporary roofing is based on 2% in CAT 1.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Roofing Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

Hurricane Sandy Temporary Housing Model

US Army Corps of Engineers

Landfall Expected In About **48** Hours

For Planning Purposes Only!

Post Landfall Temporary Housing Model Results

No housing expected from Wind

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Temporary Housing

- < 2,000 units
- 2,000 - 3,999 units
- 4,000 - 5,999 units
- 6,000 - 9,999 units
- > 10,000 units

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast. Temporary housing is based on nothing. The number indicated represents a possible need but not necessarily the scope of mission for USACE.

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Housing Model	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	Page 9 of 21

US Army Corps of Engineers

Hurricane Sandy Temporary Housing Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!

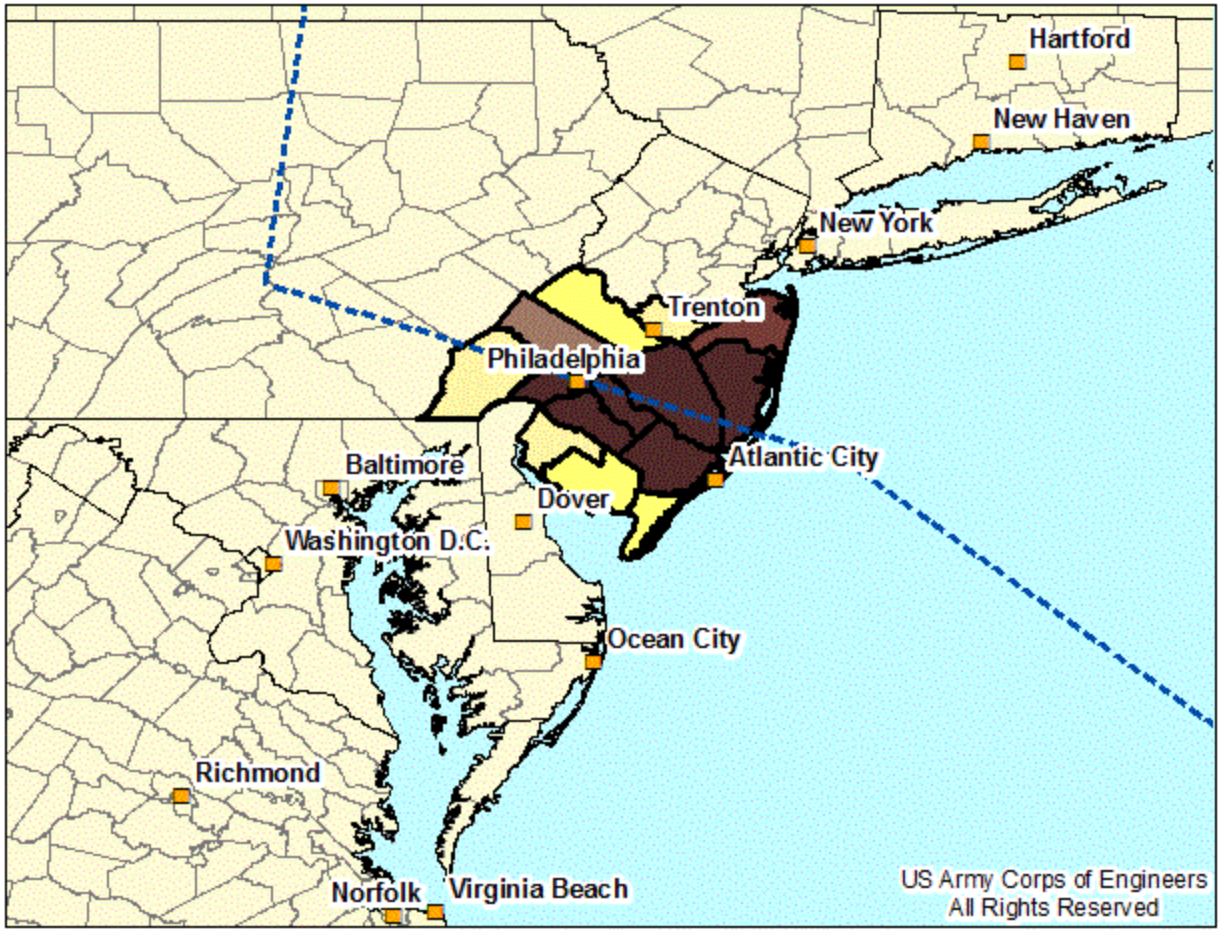
State	House Units per State	County	House Units per County

US Army Corps of Engineers

Hurricane Sandy Population Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!



Post Landfall Population Model Results

New Jersey - 2,344,000
Pennsylvania - 2,055,000

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Population

- < 25,000 persons
- 25,000 - 99,999 persons
- 100,000 - 174,999 persons
- 175,000 - 249,999 persons
- > 250,000 persons

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast. The numbers of persons included in this model output are those that would be included within estimated hurricane force winds (Census 2010 values adjusted to July 2011 values).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Population Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Population Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!

State	Population per State	County	Population per County
New Jersey		Atlantic County	276,000
		Burlington County	448,000
		Camden County	514,000
		Cape May County	33,000
		Cumberland County	30,000
		Gloucester County	257,000
		Mercer County	4,000
		Monmouth County	202,000
		Ocean County	580,000
		Salem County	< 1,000
New Jersey	2,344,000		
Pennsylvania		Bucks County	78,000
		Chester County	2,000
		Delaware County	369,000
		Montgomery County	108,000
		Philadelphia County	1,498,000
Pennsylvania	2,055,000		

The number of persons estimated to be within the hurricane force winds comes from Census 2010 values adjusted to July 2011 values.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Population Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

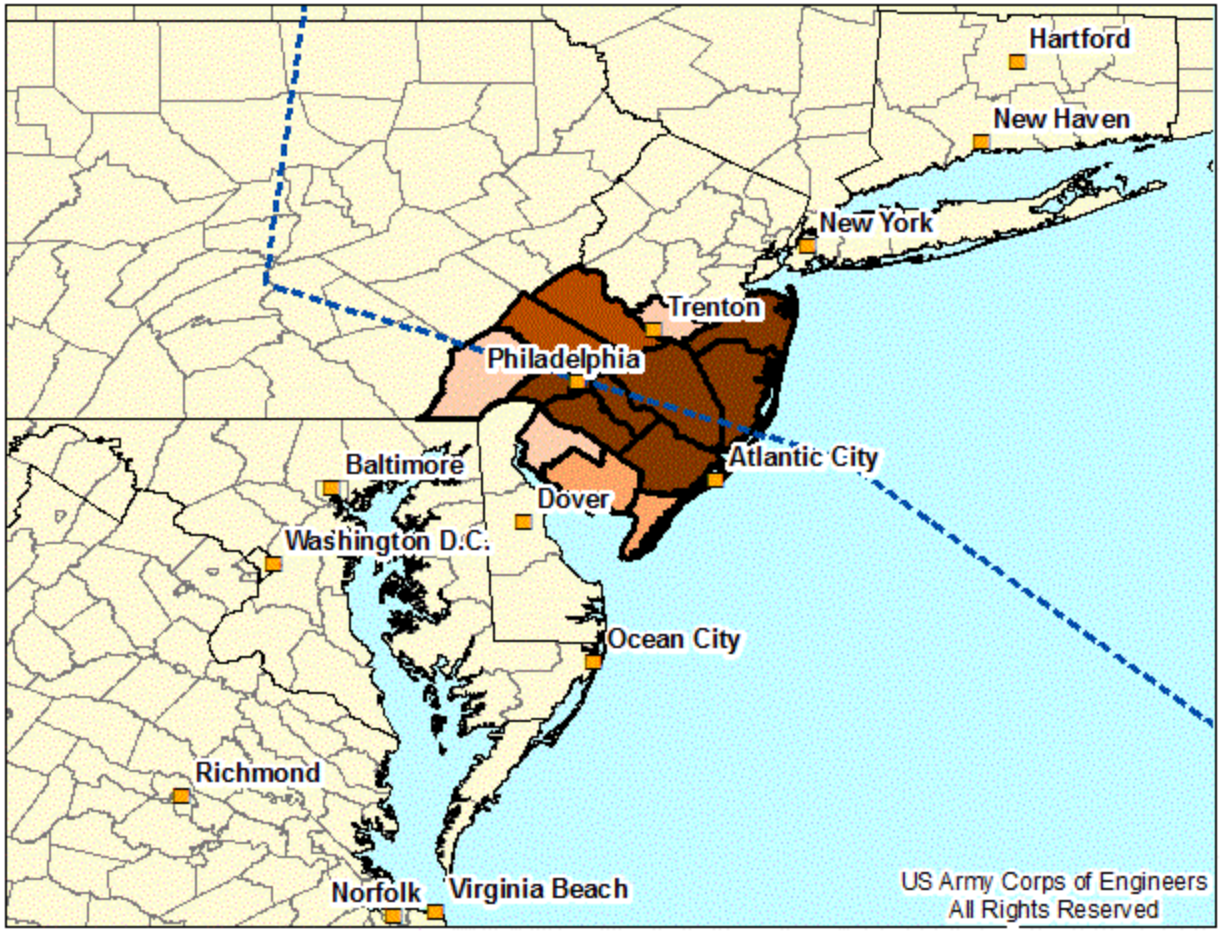
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Households Model

Landfall Expected In About 48 Hours

For Planning Purposes Only!



Post Landfall Households Model Results

New Jersey - 879,000
Pennsylvania - 796,000

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Forecast Track

Households

- < 7,500 households
- 7,500 - 14,999 households
- 15,000 - 24,999 households
- 25,000 - 49,999 households
- > 50000 households

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast. The numbers of households included in this model output are those that would be included within estimated hurricane force winds (Census 2010 values adjusted to July 2011 values).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Households Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Households Model

Landfall Expected In About **48** Hours

For Planning Purposes Only!

State	Households per State	County	Households per County
New Jersey		Atlantic County	104,000
		Burlington County	163,000
		Camden County	188,000
		Cape May County	14,000
		Cumberland County	11,000
		Gloucester County	92,000
		Mercer County	2,000
		Monmouth County	77,000
		Ocean County	228,000
		Salem County	< 1,000
New Jersey	879,000		
Pennsylvania		Bucks County	30,000
		Chester County	< 1,000
		Delaware County	141,000
		Montgomery County	42,000
		Philadelphia County	583,000
Pennsylvania	796,000		

The number of households estimated to be within the hurricane force winds comes from Census 2010 values adjusted to July 2011 values.

Details about this model may be obtained at http://www.englink.usace.army.mil
or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Source: US Army Corps of Engineers, All Rights Reserved

Hurricane Sandy Households Model

Generated By:
P.Keown, LRL 1000 EDT 10/28/2012

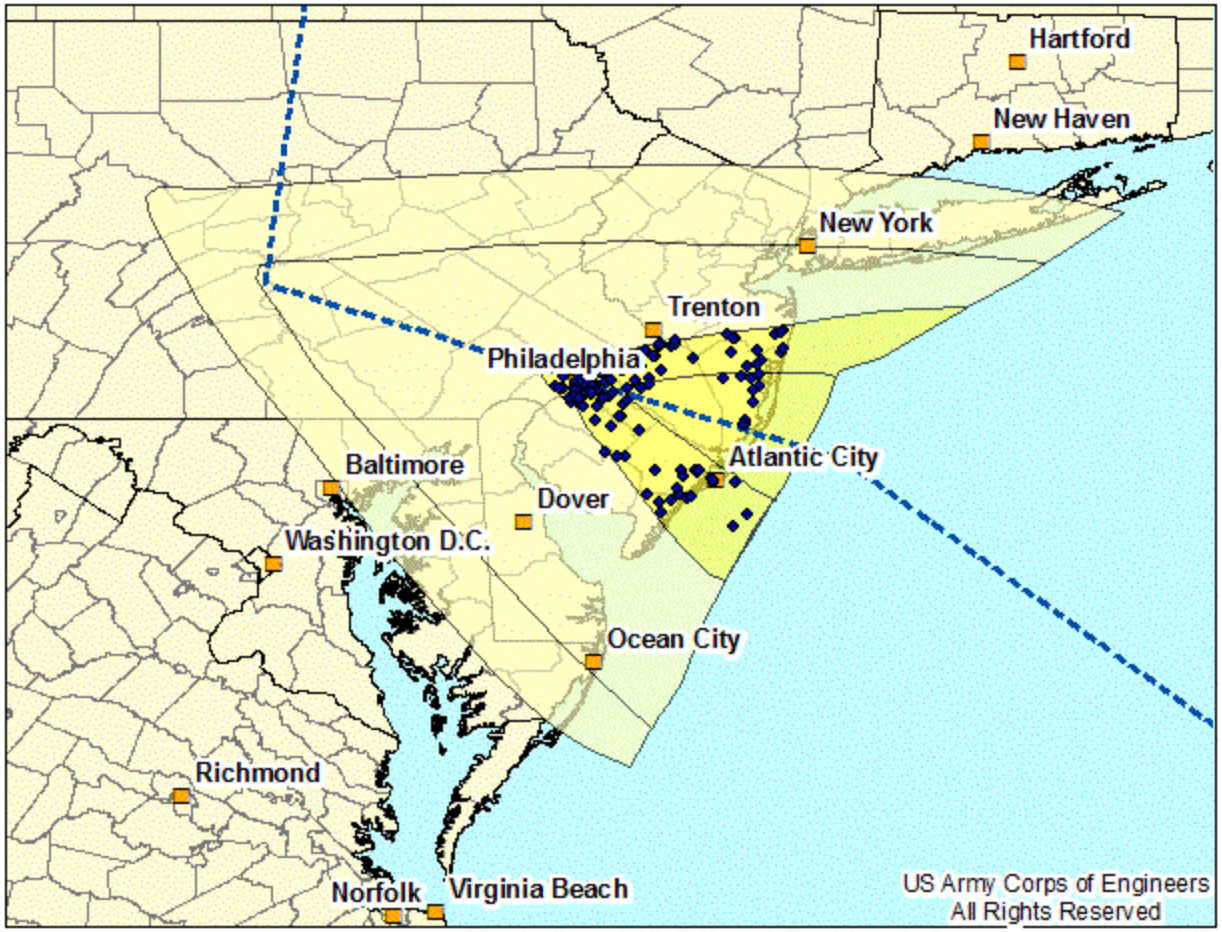
Sources:
HURREVAC
LRL-DEBRIS

US Army Corps of Engineers

Hurricane Sandy Electric Substations

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Most Probable Landfall Electric Substations Inside Hurricane Force Winds

New Jersey - 107
Pennsylvania - 47

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.
The number of electric substations included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

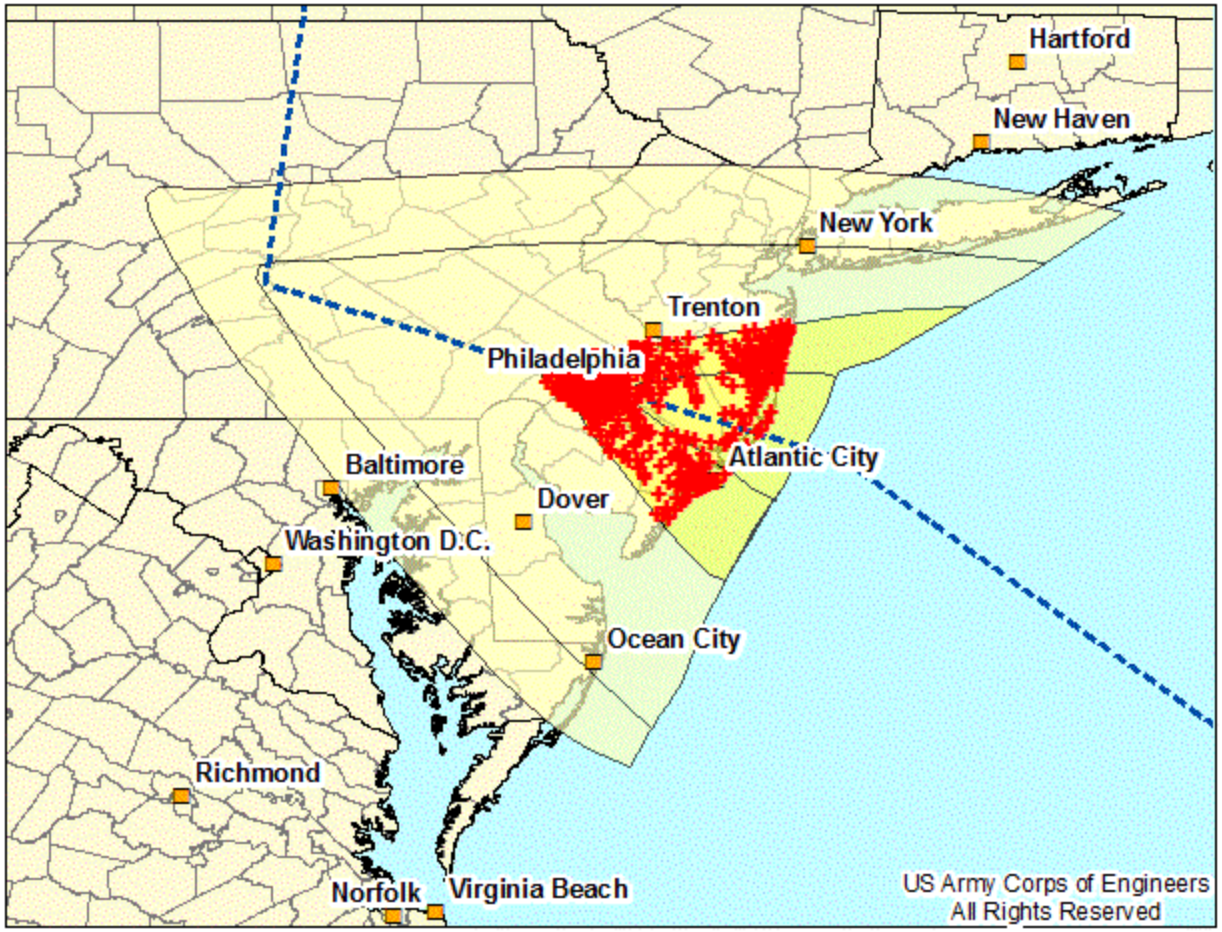
Hurricane Sandy Electric Substations	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	Page 15 of 21

US Army Corps of Engineers

Hurricane Sandy Fire Stations

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Most Probable Landfall Fire Stations Inside Hurricane Force Winds

New Jersey - 385
Pennsylvania - 134

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

+ Fire Stations

Forecast Track

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of fire stations included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

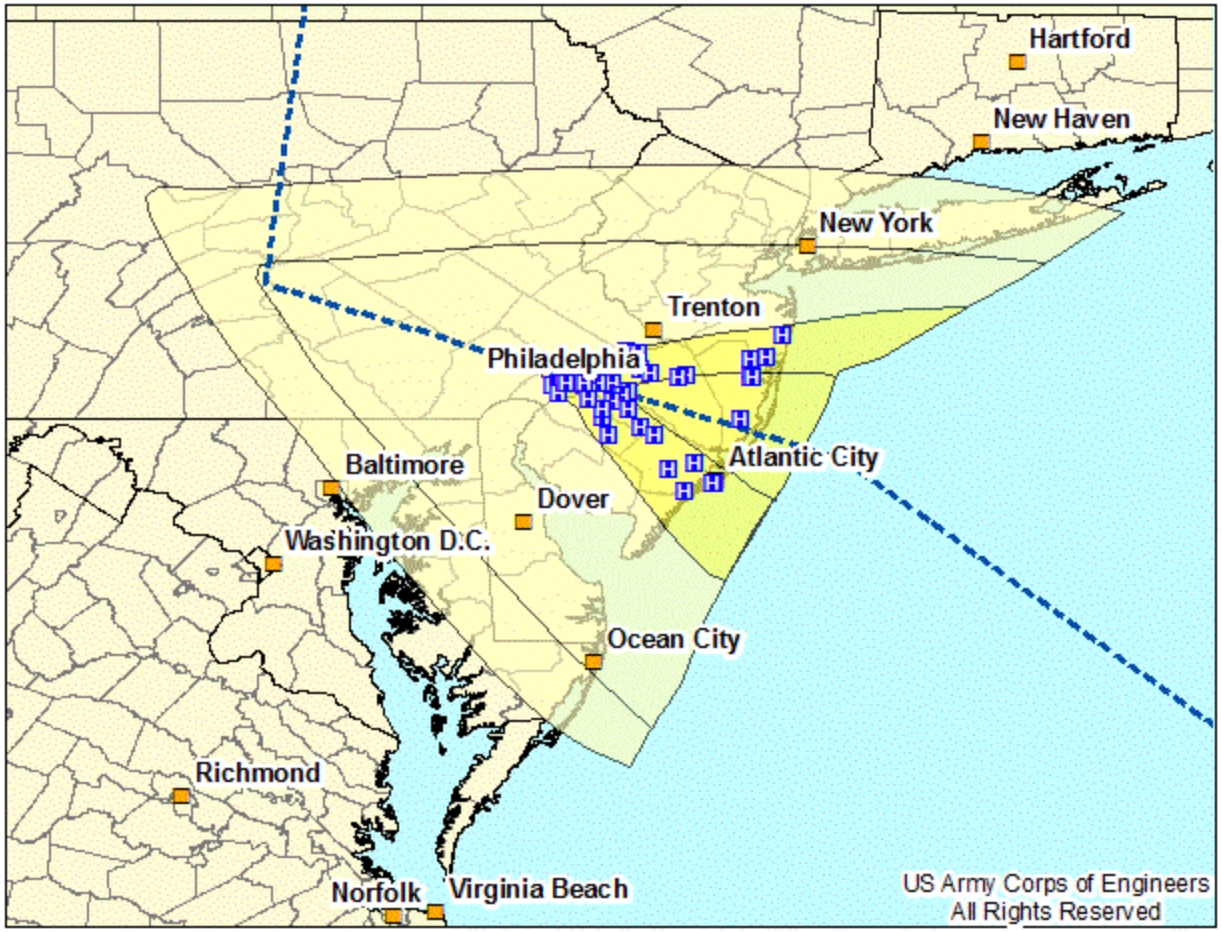
Hurricane Sandy Fire Stations	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	

US Army Corps of Engineers

Hurricane Sandy Hospitals

Landfall Expected In About 48 Hours

For Planning Purposes Only!



Most Probable Landfall Hospitals Inside Hurricane Force Winds

Pennsylvania - 47
New Jersey - 39

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of hospitals included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

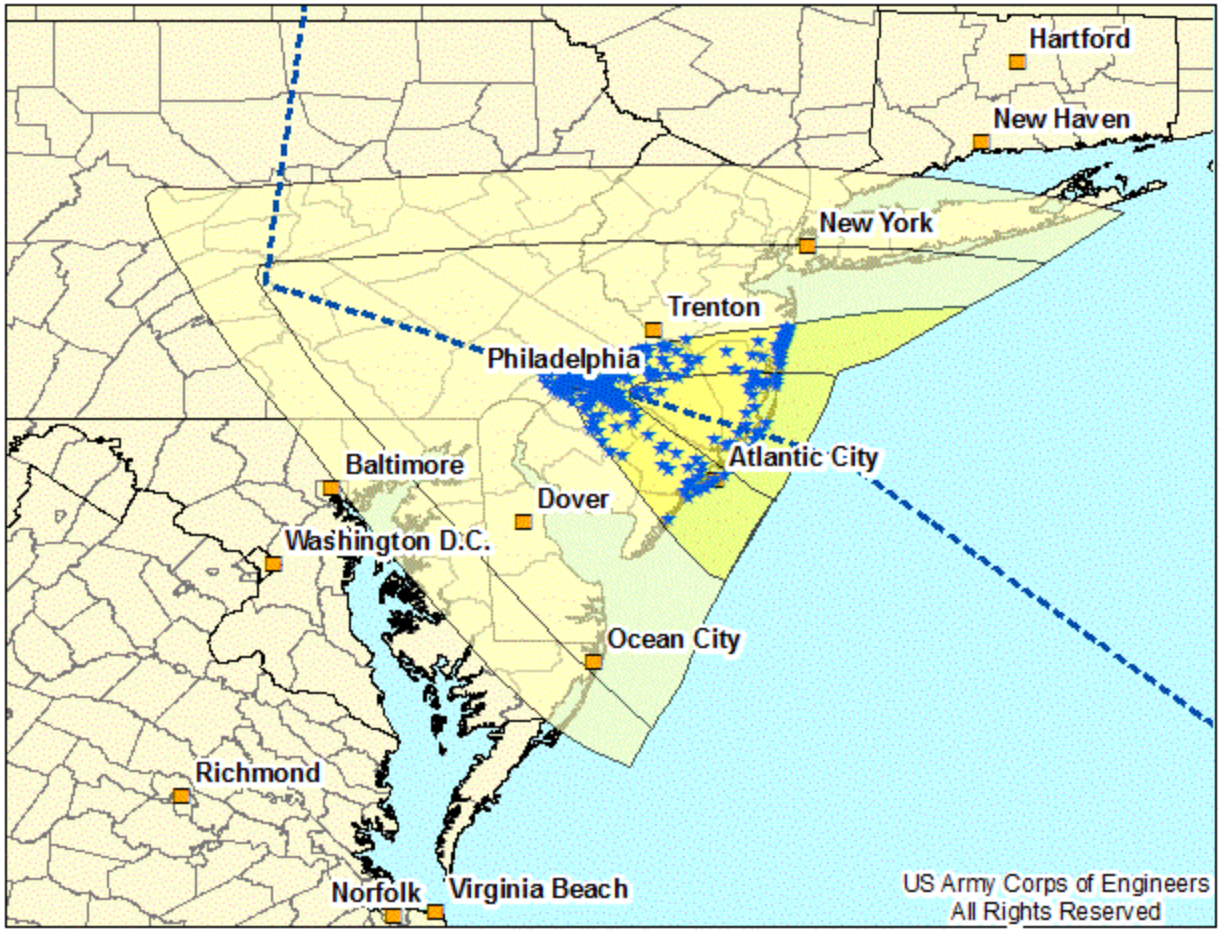
Hurricane Sandy Hospitals	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	

US Army Corps of Engineers

Hurricane Sandy Law Enforcement

Landfall Expected In About **48** Hours

For Planning Purposes Only!



0 200 400 Miles

★ Law Enforcement

Forecast Track

Most Probable Landfall Law Enforcement Inside Hurricane Force Winds

New Jersey - 186
Pennsylvania - 72

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of law enforcement included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

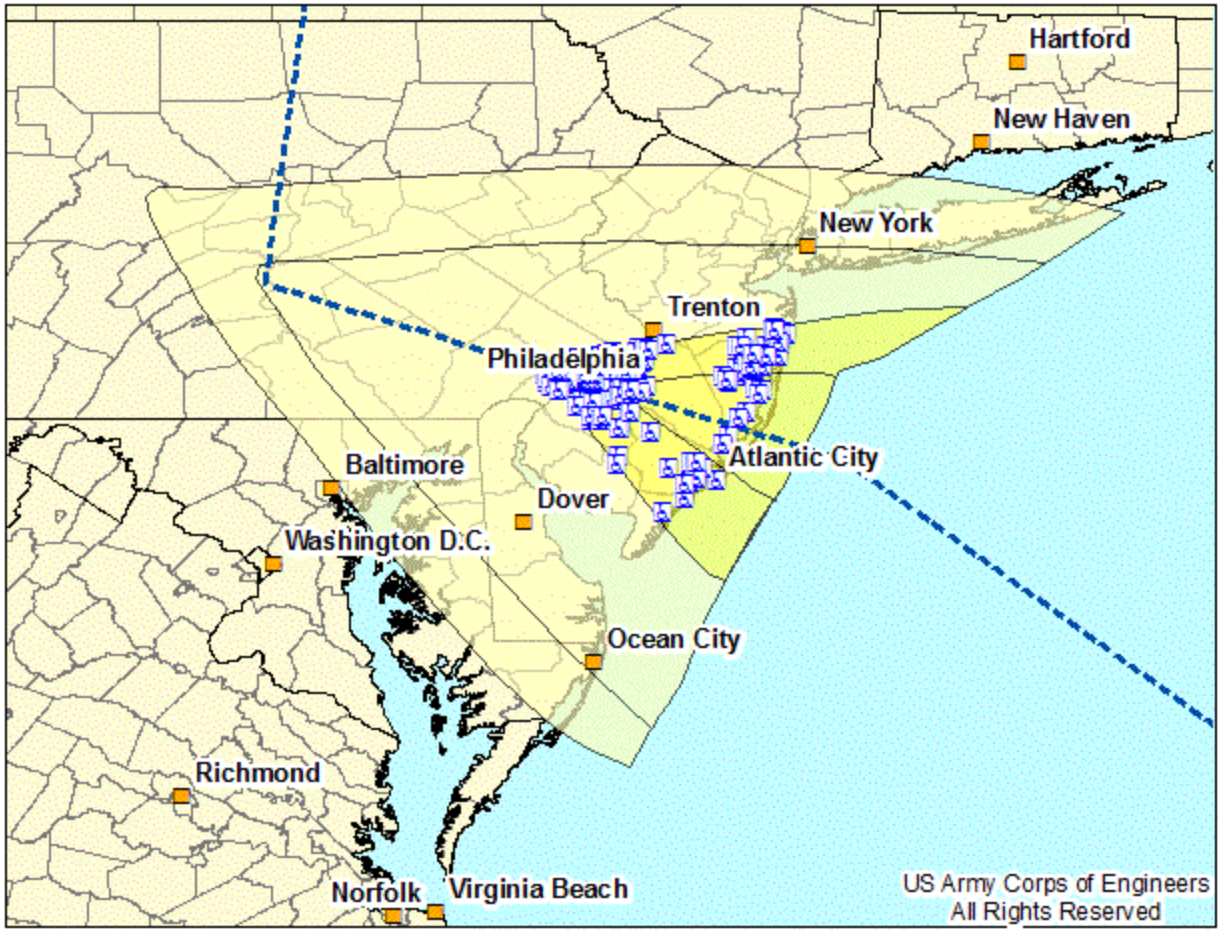
Hurricane Sandy Law Enforcement	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	Page 18 of 21

US Army Corps of Engineers

Hurricane Sandy Nursing Homes

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Most Probable Landfall Nursing Homes Inside Hurricane Force Winds

Pennsylvania - 173
New Jersey - 169

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of nursing homes included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

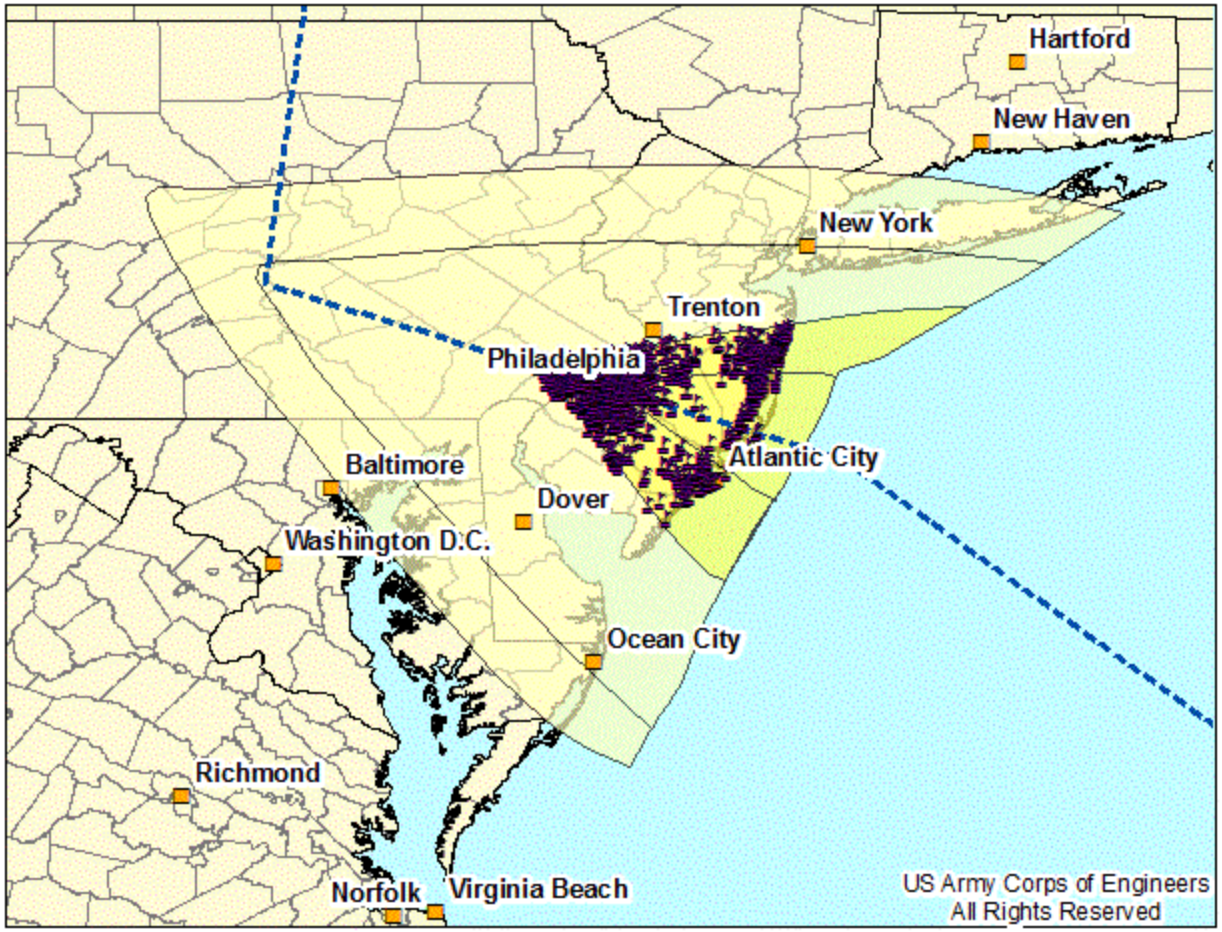
Hurricane Sandy Nursing Homes	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	

US Army Corps of Engineers

Hurricane Sandy Schools

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Most Probable Landfall Schools Inside Hurricane Force Winds

New Jersey - 685
Pennsylvania - 441

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Schools
Forecast Track

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of schools included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

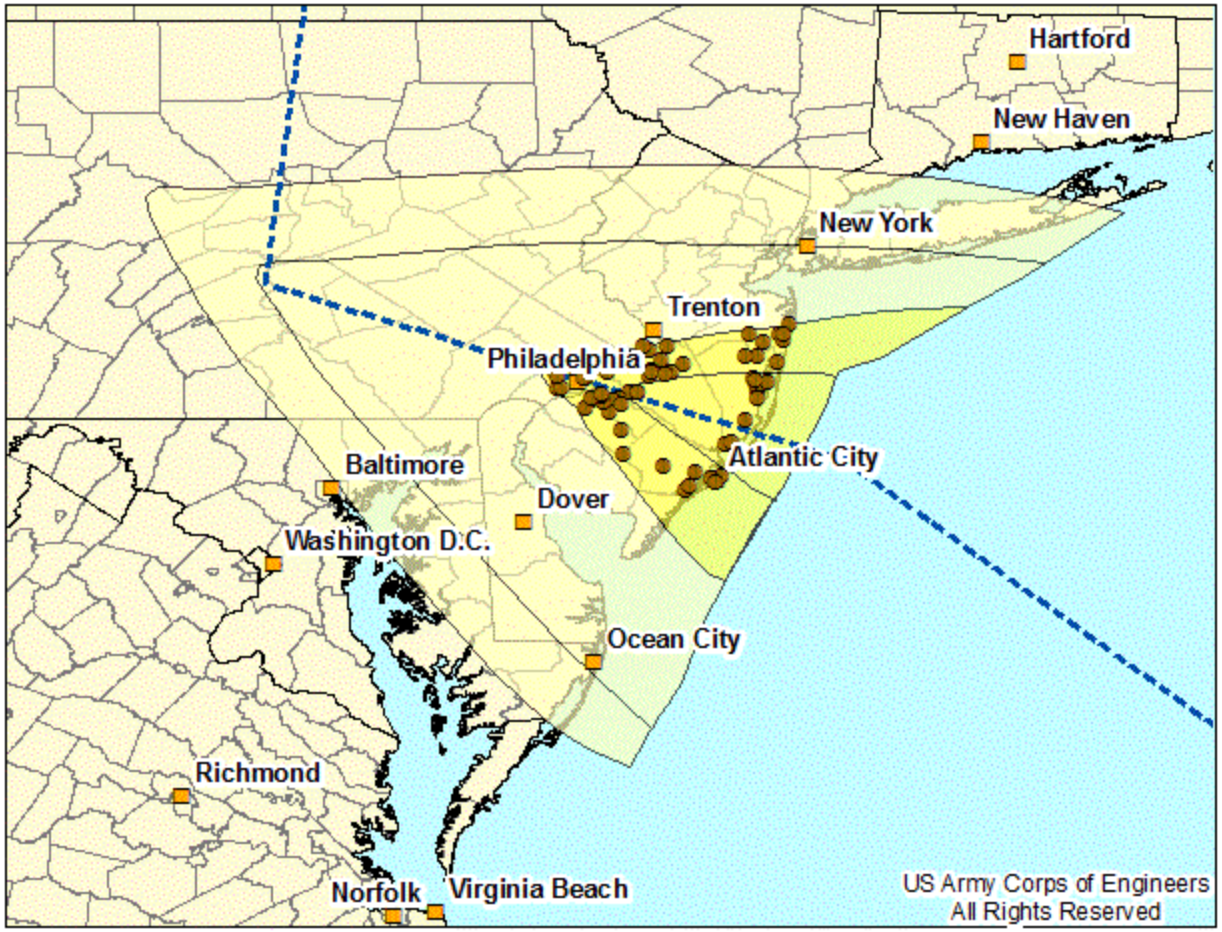
Hurricane Sandy Schools	
Generated By: P.Keown, LRL 1000 EDT 10/28/2012	
Sources: HURREVAC LRL-DEBRIS	Page 20 of 21

Hurricane Sandy Sewage Treatment Plants

US Army Corps of Engineers

Landfall Expected In About **48** Hours

For Planning Purposes Only!



Most Probable Landfall Sewage Treatment Plants Inside Hurricane Force Winds

New Jersey - 63
Pennsylvania - 11

Model results per County on following page

This model is based on a Category 1 storm making landfall in coastal New Jersey.

Sewage Treatment Plants
Forecast Track

Information provided on this page displays a Category 1 storm making landfall in coastal New Jersey. These projections are based on information from the NHC (0500 EDT 10/28/2012) forecast.

The number of sewage treatment plants included in this output are those that would be included within estimated hurricane force winds (data source: HSIP Gold 2012).

Details about this model may be obtained at http://www.englink.usace.army.mil or contact Louisville District staff at DLL-CELRL-GIS@usace.army.mil

Hurricane Sandy Sewage Treatment Plants	
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Sources: HURREVAC LRL-DEBRIS	Page 21 of 21